REMARKS

Claims 1-35 are pending in the application. Claims 1-35 are rejected. Claims 1, 22, 27, and 35 have been amended to more clearly recite applicant's invention. Claims 36 and 37 have been added. Support for these claims can be found, for example, at page 10 of the as-filed specification, and thus no new matter is being added. The specification has been reviewed and amended to correct typographical errors. Applicant respectfully requests that claims 1-37 be examined in light of the foregoing amendments and the remarks set forth below.

Rejections Under 35 USC § 112, First Paragraph

Claims 1-35 are rejected under 35 USC § 112, first paragraph, for having inadequate enablement as to how to use and make solid-state matrices embracing the Markush groups of claims 15-17. The Examiner also states that the sources of the solid-state matrix and its starting materials have not been shown with the particularity required by the statute. Applicant respectfully traverses these rejections for the reasons set forth below.

Applicant's specification includes 29 pages of detailed description and 28 pages of examples. Pages 12-17 of the specification provide a detailed description of how to use the present invention in a process for contaminant abatement. In the process, a liquid-state composition is applied to a surface or spill to be cleaned, the liquid-state composition is allowed to form a solid-state matrix which sequesters the contaminant, and the solid-state matrix is then removed, thereby providing abatement. Depending on the components of the liquid-state composition, the process may be used to clean a surface or spill, detect a contaminant in a surface or spill, mitigate the toxicity of a contaminant in a surface or spill, or perform any combination of these functions. The disclosure set forth on

these pages provides a more than adequate description of how to use the compositions of the present invention.

The solid-state matrix is described, for example, at page 11, line 17 to page 12, line 19. The solid-state matrix is formed, for example, when the solvents/carriers of the liquid-state composition are allowed to evaporate or when a drying agent is added to the matrix. Specific physical characteristics of the solid-state matrix are set forth at the top of page 12. Applicant submits, therefore, that the term "solid state matrix" is amply described in the specification.

Claims 15-17 recite compounds which are useful in the liquid-state composition. These compounds include toxicity-mitigating compounds, polymeric components, and T_g lowering agents. The specific toxicity-mitigating compounds recited in claim 15 are disclosed, for example, at page 23, line 18 to page 24, line 28. The polymeric components recited in claim 16 are disclosed, for example, at page 18, line 15 to page 19, line 21. The T_g lowering agents recited in claim 17 are disclosed, for example, at page 32, lines 12-26. As taught in the specification (page 17, lines 18-24), these compounds can be included in the liquid-state composition of the present invention.

The Examiner has stated that applicant has not described how to make or use solid-state matrices encompassing the Markush groups of claims 15-17. Applicant respectfully points out that these claims are directed to components of the liquid-state composition, and, as taught in the specification, the solid-state matrix is formed by drying the liquid-state composition. Thus, a solid-state matrix formed from a liquid-state composition comprising the compounds recited in claims 15-17 would also comprise these compounds. Applicant thus asserts that the "sources of the solid-state matrix and its starting materials"

have indeed been shown with the particularity required by the statute.

The Examiner also states that "the term 'solid state matrix' has not been shown with sufficient teaching and enablement to provide reasonable assurance" of utility. As discussed above, the term "solid-state matrix" is well-defined and well-supported in the specification. Furthermore, applicant asserts that the utility of his invention is amply demonstrated. Indeed, applicant has provided 13 examples of the use of his invention, including an evaluation of its effectiveness. For example, the percent of contaminant removed by the inventive process, the ability of the process to detect the contaminant, and the ability of the process to mitigate the toxicity of the contaminant are evaluated in the different examples.

Additionally, pages 35-39 set forth a method for determining the cleaning capacity of a liquid-state composition. The cleaning capacity for lead is defined according to the potential lead to solid-state matrix ratio of the liquid-state composition. A method for determining this ratio and threshold and preferred values for this ratio are set forth in detail in this section of the specification. As recited in claim 1, liquid-state compositions for use in removing lead in a process according to the present invention have a potential lead to solid-state matrix ratio of at least 0.1. Page 37 and examples 1 and 2 disclose compositions for lead abatement having the desired cleaning capacities.

Applicant has thus provided, in great detail, ample teaching and enablement of the invention encompassed by claims 1-35 to provide support for the utility of his invention. Based upon applicant's extensively detailed description, the numerous examples, and general chemical principles, the enablement criteria of § 112 has been well satisfied. Absent some

documented scientific evidence to the contrary, there is no reason to believe otherwise. Accordingly, applicant respectfully requests that the Examiner reconsider and withdraw this rejection.

Rejections Under 35 USC § 112, Second Paragraph

Claims 1-35 are rejected under 35 USC § 112, second paragraph as indefinite for the recitation of the terms "lead contaminant," "surface comprising," "allowing the composition to solidify," "contaminant-detecting compound," "liquid-state composition" and "solid-state composition." Applicant submits that each of these terms is well defined and fully supported by the disclosure of the specification.

Lead contaminants are disclosed, for example, on pages 2 (lead halides, white lead), and 5 (lead from pipes or solder, lead from gasoline emissions, lead from soil, lead-based paint, lead dust). While applicant has presented specific examples which demonstrate the cleaning of lead oxides and lead halides, there is no teaching or suggestion in the specification that the invention is limited to these specific lead contaminants. Applicant is not required to provide an example for every contemplated embodiment of his invention. "There is no magical relationship between the number of representative examples and the breadth of the claims." In re Borkowski and Van Venrooy 164 USPQ 642, 646 (CCPA 1970). The disclosure provides many examples of "lead contaminants," and applicant supports that this term is not indefinite in light of the teachings of the specification.

While applicant believes that the term "surface comprising" is well defined in the specification, in order to expedite prosecution of the application, applicant has amended the claims to recite instead "a surface contaminated with a contaminant." Applicant believes that this term is definite, and encompasses surfaces which have adsorbed or absorbed the contaminant, as well

as surfaces wherein the contaminant is on the surface, but not necessarily adsorbed or absorbed, such as lead dust found in and around window sills (see, e.g., page 5 of the specification). It is thus believed that this rejection has been overcome.

Applicant asserts that the phrase "allowing the composition to solidify" is definite and well defined in light of the teachings of the specification. (See, *e.g.*, page 11, lines 17-24.) While the time period required for the composition to dry may vary, for example, from a few minutes to a day, the meaning of this phrase is clear. One skilled in the art would readily know what is meant by "allowing the composition to solidify," and one can readily determine, by observation, when the composition has solidified. Applicant thus asserts that the step of "allowing the liquid-state composition to solidify" is clear, definite, and fully supported by the specification. Applicant therefore requests withdrawal of this rejection.

The term "contaminant-detecting compound" is fully supported in the specification. Contaminant-detecting compounds useful in the present invention are disclosed from page 19, line 22, to page 23, line 3. Compounds useful for detecting lead are disclosed, for example, at page 20, lines 1-18. A description of how to use contaminant-detecting compounds according to the present invention is found at page 13, line 12, to page 16, line 5. As stated at page 14 of the specification, the contaminant-detecting compound may be included in the liquid-state composition, or may be applied separately. Applicant therefore has not left the determination of what is operable and what is not operable for others to determine, but has instead provided a detailed description of useful contaminant-detecting compounds along with guidance on how to use them. While those skilled in the art may use the teachings of the present invention to envision other useful contaminant-detecting compounds within the

scope of the present invention, no amount of undue experimentation is required to practice the invention.

As discussed above, the terms "liquid-state composition" and "solid-state matrix" are fully defined in the specification. Useful liquid-state compositions are described, for example, at page 10, lines 26-30, and from page 17, line 18, to page 19, line 21. Additional components of useful liquid-state compositions are set forth from page 19, line 22, to page 35, line 7. A specific method for determining the lead-cleaning capacity of a liquid-state composition is set forth from page 35, line 8, to page 39, line 5. It is thus presented that applicant has provided a full description of the "metes and bounds" of liquid-state compositions according to the present invention.

The "solid-state matrix" of the present invention is described, for example, at page 11, line 17 to page 12, line 19. As stated above, the "solid-state matrix" is formed by solidifying the liquid-state composition, for example, by allowing the solvent components to evaporate and/or by using a drying agent. Thus, the "metes and bounds" of solid-state matrices obtained during the processes of the present invention are well defined.

Applicant thus asserts that the terms used in claims 1-35 are definite and fully supported in the specification. Applicant further submits that, in light of the detailed description provided in the specification of how to make and use compositions according to the present invention, no undue experimentation is required to practice the present invention. Applicant therefore respectfully requests that the Examiner reconsider and withdraw the rejections of claims 1-35 under 35 USC § 112, second paragraph.

Rejections Under 35 USC § 103

Claims 1-35 are rejected under 35 USC § 103 as unpatentable over Japanese patents JP 59-189200 and JP 842666 (840215) submitted by applicant in an Information Disclosure Statement filed May 7, 1993. Applicant respectfully points out that Japanese patent JP 60-170674, which claims priority to JP 842666 (840215), was made of record in the Information Disclosure Statement, and assumes that it is JP 60-170674, and not JP 842666, which the Examiner is citing. Clarification of this point is respectfully requested.

The Examiner states that these patents teach "applying a polymeric substrate that is dryable or curable to a surface containing a lead contaminant, with the substrate containing color indicating agents and basic inorganic chemicals therein capable of reacting with the lead contaminant, then subsequently peeling off or removing the lead contaminant-containing polymer matrix." Applicant respectfully traverses this rejection. As seen from the English translations attached hereto as APPENDICES 1 and 2, neither of the cited references discloses (i) processes or compounds for cleaning a lead-contaminated surface, (ii) detecting the presence of lead or another contaminant, (iii) mitigating the toxicity of lead or other contaminants, or (iv) accelerating the drying process by using a drying agent, as taught by the present invention.

JP 59-189200 (JP '200) discloses a method for cleaning staining material, such as dust or cooking grease, from a smooth surface, such as glass or stainless steel. The cleaning composition comprises an aqueous dispersion composite obtained by the consecutive emulsion polymerization of at least two radically polymerizable unsaturated monomers having T_g values which differ by at least 30 °C. The cleaning composition is prepared according to a lengthy polymerization process, applied to the surface to be cleaned, allowed to dry, and then removed.

There are many significant differences between JP '200 and applicant's claimed invention. JP '200 does not disclose or suggest compounds or processes for cleaning lead or other hazardous contaminants, but instead cleans only staining materials, such as dust and cooking grease. There is no suggestion in JP '200 that the compositions therein would be useful in removing lead contaminants, especially those found in porous or irregular surfaces, where most lead contaminants are found. Indeed, JP '200 discloses the use of its compounds only in cleaning glass or stainless steel. This is in contrast to the present invention, which provides a method for cleaning porous surfaces such as wood, cement, brick, cinder block, plasterboard, wall board, and soil, as well as for cleaning smooth surfaces such as aluminum, steel and glass (specification at page 10 and claims 36-37).

JP '200 also fails to suggest the use of contaminant-detecting compounds, toxicity-mitigating compounds, or chemical drying agents, as recited in applicant's claims. In sum, applicant's claimed methods represent a novel and non-obvious approach to the very difficult problem of cleaning surfaces contaminated with hazardous contaminants, such as lead. Absent some suggestion in JP '200 that lead contaminants could be removed by the method disclosed therein, applicant's claimed methods cannot be obvious.

Attached hereto as APPENDIX 3 is an article from the July 10, 1991 issue of "Newsweek," which states that "lead poisoning is now being called the nation's No. 1 environmental threat to children" (page 43). At page 44, it is seen that, in fact, lead contaminants are often found on rough and porous surfaces, such as interior and exterior walls, radiators, and door, stair and window trim. Beginning at page 46 of the article, there is a discussion of "Removing lead from a home." The only recommended methods of removing lead are (1) entirely encapsulating or

covering all contaminated surfaces - the very antithesis of using a removable coating -- and (2) removing the entire painted structure. There is no suggestion of using a removable coating to effect cleaning. Indeed, known methods directed at removing just the contaminated surface, such as by scraping, using a heat gun, or power sanding, are indicated as being dangerous because they may actually increase the danger of exposure to lead by creating additional lead dust (pages 46-47). Methods of removing lead dust, such as damp-mopping, wiping with detergent, or vacuuming, can be ineffective, and may also create additional lead dust (pages 5-7 of the instant specification).

Attached as APPENDIX 4 is an article from the April 1990 issue of "Modern Paint and Coatings," which discusses the problems associated with lead-based paint, and the hazards which are associated with abatement procedures. Pages 39-40 discuss lead abatement procedures used in Baltimore, Maryland public housing. Maryland state law "requires that the lead paint ... be removed ... and the unit thoroughly cleaned to meet exacting standards.... The quality of the abatement work is judged in terms of how much lead is in the homes in surface dust following the abatement," (emphasis added) and families are not returned to homes until the standards are met. The article emphasizes the importance of a thorough abatement procedure because "painting over [lead] residue just creates new lead paint" (page 40).

Attached as APPENDIX 5 is page 12 of the *Army's Lead-Based Paint Guidelines: Part 2* Vol. 2, No. 8. (1993). This article also emphasizes the need for post-abatement cleanup, and states that "unless great care is taken ... the dwelling may be more hazardous after treatment than it was before." The article also indicates that lead dust is "invisible, sticky and hard to clean up."

The state of the art indicates the urgent national importance of processes for cleaning surfaces contaminated with lead. As indicated in APPENDIX 6, the Department of Housing and Urban Development has put out a call for information on new technologies, innovations and work practices in lead abatement, including new abatement methods, cleanup methods, and innovations in worker protection. This need, coupled with the absence of any suggestion in the art of using a removable coating to clean lead-contaminated surfaces, provides strong evidence of the non-obviousness of applicant's invention.

The Examiner also has cited JP 60-170674 (JP '674) as rendering the present invention obvious. JP '674 discloses a paint which forms a transparent strippable film which can be stripped off from the surface of the parts of an electric fan. The paint contains a basic substance and a color indicating agent, such as phenolphthalein, to allow visual discernment between coated and uncoated areas. As the paint dries, the color of the indicator disappears.

JP '674 is directed to much the same problem as JP '200, and similarly fails to teach or suggest the process and compositions of the present invention. Like JP '200, JP '674 discloses a process for cleaning dust or cooking grease from smooth surfaces, such as fan blades. However, in JP '674, the paint is applied to a clean surface, thus protecting surface from dust. As the surface gets dirty, the paint can be removed, together with the dust adhered to its surface, thus leaving a clean surface. This surface can again be coated with the paint. This process does not suggest or make obvious the process of the present invention, where the liquid-state composition is applied to a surface or spill already contaminated with a contaminant, and in which the compositions use physicochemical interactions and reactions to effect cleaning, contaminant-detecting and/or toxicity-mitigating.

The color indicating agent and basic compound of JP '674 serve as an indicator of where the paint has been applied. When the paint is wet, the basic compound causes the color-indicating compound to be colored. As the paint dries, the basic compound evaporates from the paint, and the color-indicating compound loses its color. This allows the person applying the paint to readily determine where paint has been applied. The color of the color-indicating agent of JP '674, therefore, changes regardless of the presence or nature of any substance on the treated surface. In fact, because the paint is applied to a clean surface, and because the color indicating agent loses its color as the paint dries, the color indicating agent is inactive by the time it is exposed to any dirt.

This color-indicating compound, therefore, in no way suggests or makes obvious the contaminant-detecting compounds of the present invention. The contaminant-detecting compounds of the present invention are specific to the contaminant being detected, and may react chemically with the contaminant to provide a visual signal of the presence of a contaminant on the surface or in the spill being cleaned. Once a color change has occurred the contaminant-detecting component will remain that color, and continue to signal the presence of a hazardous material. Therefore, the contaminant-detecting compounds of the present invention do not provide an indication of where the liquid-state composition has been applied, but instead provide an indication of where contaminants are located. The indicators disclosed in JP '674 are not useful in the present invention as contaminant-detecting components, and there is no teaching or suggestion in JP '674 of using other indicator compounds to detect the presence of a contaminant.

In sum, JP '200 and JP '674 do not render obvious applicant's invention. Accordingly, in view of the foregoing amendments and remarks, applicant believes that claims 1-37 are

in condition for allowance, and an early indication of the same is respectfully requested. If Examiner Springer should have any questions regarding this application, he is invited to contact the undersigned attorney at the number below.

A petition for a one-month extension of time, the petition fee, and the fee for additional claims are attached. It is believed that no additional fees are required; however, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 19-0741.

If any additional extensions of time are required for this response, applicant expressly petitions for such, and hereby authorizes the Commissioner to charge the necessary fee to Deposit Account No. 19-0741.

Respectfully submitted,

11/8/93
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I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Honorable Assistant Secretary and Commissioner of Patents and Trademarks, Washington, D.C. 20231 on 11/8/93
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